Minutes of spin meeting 07/09/08

Leif first presented the chromaticity measurements from both injection with dwell field (March 9) and injection-on-the-fly(February 5, an intermediate setup). The motivation is to get another piece of the puzzle of AGS pp setup near injection. The March 9th measurements gave chromaticities along the whole ramp. Near injection, both chromaticities were around -5 (unnormalized). For a subset of the tune measurements in the injection-on-the-fly case, the coherence died quickly. An operator is wokring on turn-by-turn fitting to get vertical tunes isntead of simple FFT. Leif also provided $G\gamma$ as function of time along the ramp based on the frequency measurements. In answering Thomas' question, he estimated that the error is a few ms, which is supported by the location of $0 + \nu$. Thomas is interested in deriving triggers for horizontal tune jump. Since the actual spin tune is not exactly $G\gamma$, we need spin tune as function of time, too. Mei asked if we can manipulate the weak resonance strength as described in Vahid's thesis. Thomas commented that the manipulation is based on P=12 while the resonance enhancement near $G\gamma = 5$ is due to the symmetry broken after introducing two partial snakes (and compensation quads). So that method is unlikely working here. The beam size is maintained constant in the design of currently used vertical tune path. If we remove this constraint (presumably sacrifice aperture), we should reduce polarization loss due to vertical intrinsic resonances (as shown by Fanglei last week). Nick will look at this solution (maintain high vertical tune starting from injection, say 8.95). In the chromaticity measurements for injection-on-the-fly lattice, Both chromaticities crossed zero at 185ms. Thomas questioned if this can explain the observed larger horizontal emittance for this setup (namely, emittance growth due to instability). Woody commented that to make a flattop at $G\gamma = 7.5$ for injection-on-the-fly is not easy, if one want to measure poalrization for the two setups in the early part of the acceleration.

Woody showed the specifications for the tune-jump power supply he gave to Jian-Lin. The rise time is $100\mu s$ and the falling time is $200\mu s$(Jian-Lin's current design does not allow to change the falling time freely, and it is longer than the rising time). Thomas commented that the falling time should also be $100\mu s$ although the jump amplitude can be relaxed due to spin chromaticity. The drooping of holding current (between the two tune jumps) and the overshooting of falling edge were both set as 10% of the amplitude of the jump. Woody reported that currently the lead conductor inductance is about twice of the magnet inductance and is too high. Thomas asked if Litz wire an option. Woody will work with Jian-Lin to reduce the lead conductor inductance. Arlene will report some test results and thoughts on the power supply design next week.

Leif then reported that Frank Karl surveyed the dipole magnets in D superperiod. He found that the horizontal positions are off from reference positions by a few mm. The question is how would this impact the horizontal orbits. Waldo said that the spin is sensitive to the horizontal orbit between the two partial snakes according to his calculation. Thomas felt that we should be cautious of moving AGS magnets. We will discuss this issue in separate meeting.

Last but not the least, Thomas informed us that it is almost certain that next run(run9) is going to start in the mid-February as a pp run. This implies that AGS pp setup should start at the beginning of February. We need to act quickly on the tune jump approach if we plan to use it for the coming run.

Haixin